

GEM<sup>4</sup> - AUGUST 2006

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## GENERAL DISCUSSION OF THE DYNAMICS OF INFECTIOUS DISEASES

INFECTIOUS DISEASES  $\Rightarrow$  INVASIVE MICROBES THAT REACH:

- ONE OR MANY TISSUES

- TISSUES WHERE THESE MICROBES SENSE SIGNALS  
THEIR GENOME CAN PROCESS

$\rightarrow$  PRODUCTION OF TRANSMISSIBLE PROGENY VIABILITY

- BEFORE 1970s NOT MUCH WAS PUBLISHED IN TEXT BOOKS ABOUT MICROBIAL INFECTIOUS DISEASES
- LAST 35 YEARS, A LOT OF ATTENTION ON MICROBIAL DISEASES
- CURRENTLY, GENOMICS HAVE SEQUENCED MANY OF PATHOGENIC MICROORGANISMS

ECOLOGY OF *M. ULCERANS*, THE CAUSATIVE AGENT OF BURULI ULCER (SKIN DISEASE)

$\rightarrow$  CENTRAL + SOUTH AMERICA, CENTRAL AFRICA, INDIA, ASIA, SOUTH PACIFIC, AUSTRALIA

- NO TOOLS IN ENDEMIC AREA FOR EARLY DIAGNOSIS
- NO IMMUNOLOGICAL INTERVENTION
- MODE OF TRANSMISSION

$\rightarrow$  NO INTER-HUMAN TRANSMISSION

"RESERVOIR" OF MICROBE IS AQUATIC ENVIRONMENT  
IN TROPICAL AREA.

→ IT IS NOT A BLOOD-FEEDER

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COLLECTION OF SAMPLES OF INSECTS LIVING IN  
SWAMPY AREAS. THE ARE:

- CARNIVOROUS
- LIVE IN RIVERS, SWAMPY AREAS
- ABLE TO FLY
- ABLE TO "BITE" HUMANS THEY "MISPERCEIVE" AS PREYS.

SALIVA CONTAINS IMMOBILIZING AGENT  
AFTER FED WITH M. ULCERANS, IT TENDS TO  
LOCALIZE AT THE SALIVARY GLANDS

INFECTION OF MICE EXPERIMENTS  $\Rightarrow$  LESS THAN 30 SECONDS  
OF EXPOSURE TO INSECT RESULTED IN TRANSMISSION.

- WATER BUGS ARE ABLE TO TRANSMIT M. ULCERANS TO  
LABORATORY MICE, LATTER DISPLAYING TAIL ULCERS

HOW M. ULCERANS IS LOADED TO INSECTS AS CARRIERS?

By <sup>INSECTS</sup> FEEDING FROM OTHER ORGANISMS THAT EAT PLANTS  
CARRYING M. ULCERANS ON SURFACE

M. ULCERANS BINDS TO AND GETS INTERNALIZED BY MACROPHAGES